Weekly Report for 02/24/2014

Highlights

• Developing APS upgrade lattice with off-axis injection (accumulation). (Yipeng Sun)

• Wrote sdds2hdf which can be used to convert SDDS files into HDF5 files. This was requested by the author of GINGER but it is a general purpose tool which can lead to interoperability with other HDF5 applications. (Robert Soliday)

• Gave an invited colloquium at the Purdue Physics Department on Accelerator Science. (Kathy Harkay)

• Wrote the injection section for the paper prepared for Journal of Synchrotron Radiation. (Aimin Xiao)

• Completed the dry-run session which included the five presentations by task leaders for S37 scraper upgrade project review scheduled on the Februray 26 (the event had been postponed). (Yong Chul Chae)

APS Renewal and Upgrade

• Met with J. Carter, L. Boon, and H. Cease to discuss the status of the CERN SynRad vs Cornell synrad3d benchmark. He will present this work at the upcoming MBA vacuum review. (Kathy Harkay)

• Developed the normalization of the photon flux on the wall from synrad3d results, using the standard definition of photons per sec per 0.1% bandwidth. Discussed this with L. Boon, who is computing the photon flux on the SCU0 absorber and a 6-mm ID chamber for the MBA. (Kathy Harkay)

• Sent the specification of Lambertson magnet to M. Jaski for conceptual design. (Aimin Xiao)

• Discussed with C.Y, J. Wang, F. Lenkszus, L. Morrison on various MBA injection kicker timing, layout and specification issues. (Aimin Xiao)

• Discussed putting ID kickmap to MBA simulation with M. Borland, provided him with various kickmap from previous ID design. (Aimin Xiao)

MCR Operations

Storage Ring Operations

• Reviewed MPS dump FPGA bpm history data for 8 unplanned dumps (Jan-Feb) for comparison with SCU0 BLM data. Attempted to plot comparisons of quench and no quench cases. Unfortunately, there are no FPGA history data for the no quench cases; the beam was completely lost either before or after the history data were acquired. (Kathy Harkay)

• Discussed more SCU BLM data that J. Dooling acquired for 3 unplanned beam dumps during operations. The SCU0 did not quench for one of these, but there is no obvious difference in the corresponding BLM integrated signal. (Kathy Harkay)

• Provided my input to engineers who are designing the transition for the 5-mm ID chamber that is to go in ID30. I recommended that the transition horizontal aperture should be 30 mm, the ellipse should be aligned with the 5-mm extrusion aperture to the best extent possible, and the center of the extrusion should be defined as the center of the 30-mm ellipse. (Kathy Harkay)

• Analyzed beam motion data that was intermittent on Feb 21, trying to identify the timing of the two ramps in orbit. (The ramps seems to be separated by a little less than one RTFB clock interval.) (Louis Emery)

• Measured fpga bpms response to sample clock timing error. Compared slope with apparent offset

change after a reboot event last week and found no agreement. So there some unknown effect in these bpms. (Louis Emery)

• Looked at history of S38 Cerenkov counts including the study day (Feb 11th) where a high rate was generated by S38 scraper. At that time the count rate was useless. However under normal circumstances is it a reasonable 30 counts/sec. (Louis Emery)

• Determined with F. Lenkszus the problem with elevated 150 Hz in vertical plane. The problem was a bpm which reads almost normal noise levels with loops open, but shows large noise with loops closed. (Louis Emery)

• Performed a couple of single gap scans during User operations to restore X-ray bpms to orbit configuration after steering. (Karen Schroeder)

• Injection efficiency deteriorated badly on Wednesday afternoon. Obasohan noted that the SR to Booster phase had changed noticably on the scope. The phase was changed and Users notified. An initial investigation of temperatures, phase shifters etc. showed no changed. Fystro found later that evening that the rf source voltage level (envelope detector) had dropped at the time the injection efficiency did. Passed the info on to the RF group who said they would check at next machine studies as any attempt to fix during User operations might either dump or disturb the beam. Sent out additional information Users by X-ray ops e-mail. (Karen Schroeder)

• Sent detailed information to a User who was seeing drifts starting about the same time we had problem with the rfsource. (Karen Schroeder)

• Investigated beam losses. (Karen Schroeder)

• Found IEX would periodically showed that it was still on after a gaps open command was issued after a beam loss, leaving the the BPLD armed. Found that resetting the power supply interlock would clear the false indication.During machine studies, verified that this reset, if needed during User operations with beam, would not cause a beam loss. Made a daily order with information for the MCR. (Karen Schroeder)

• Discussed possible consequences of an IOCRFtime reboot with Lenkzsus. Brought the information to MCR and gave instructions on notifying Users and monitoring during the reboot to verify all our timing remained constant. (Karen Schroeder)

• Assisted the MCR with turning beam over to the Users after machine studies. (Karen Schroeder)

• Investigated beam motion issues. (Karen Schroeder)

Procedures

• Reviewed Power Supply swap-out procedure and rejected. Sent a list of changes to take into account the conversion to A:QS4 from A:V4. (Karen Schroeder)

• Updated list of required classed and required reading for SR Operator Qualification procedure (Karen Schroeder)

MCR Operations administrative/misc.

• Produced downtime report and either gave it to Flood for presentation or presented it myself at OPS Directorate. (Karen Schroeder)

• Reviewed and approved non-RSS storage-ring work requests. (Karen Schroeder)

APS Machine Studies

Storage Ring Studies

• Carried out measurements with J. Dooling of beam dump induced beam losses at SCU0 BLMs with and without triggering the IK5 vertical pinger with the MPS dump. We also repeated measurements with no ID28 bump (no IK5). The BLM data will be analyzed soon. (Kathy Harkay)

• Performed orbit switch from 24 to Hybrid fill. (Aimin Xiao)

• Made a plan to prepare several hor. bumps in ID4 with corrected optics and coupling. This is to determine experimentally whether the presumed -13 mm aperture (originally thought to be -15 mm) can be detected. (Louis Emery)

• With Sajaev investigated discrepancies in the processing of bunch current monitor between two methods. (Louis Emery)

• Produced beam-related portion of machine study schedule. Updated the schedule several times as needed. (Karen Schroeder)

• Performed gap scans to updated ID gap feed forward tables. (Karen Schroeder)

• Attempted to take orbit response measurement. While doing so, most of the singlet in the hybrid fill was kicked out (down to approximately 2.3mA). Passed info on to Sajaev and Emery. Sajaev decided to skip this measurement during the hybrid fill and start taking it during studies for 324 and 24 singlets. (Karen Schroeder)

• Discussed with Sereno possible reasons for some of the problems they had doing the mombo scans during studies. (Karen Schroeder)

• Assisted MCR during non-beam machine studies as needed due to lack of available personnel. (Karen Schroeder)

APS Machine Research and Development

Storage Ring Research and Development

• Reviewed a paper on generating THz radiation by Y. Shoji and prepared a first draft presentation for a future AOP group meeting. (Kathy Harkay)

• Read manual for gdfdl; preparing to learn more about wakefield simulation for the APS. (Ryan Lindberg)

• Wrote email to relevant persons summarizing on what approach we should take on assembling smaller x-aperture chamber for ID30. (Louis Emery)

Linac Research and Development

• Spent time in the MCR as part of the team working to condition the LCLS-style photocathode gun. (Ryan Lindberg)

ITS Research and Development

• Measured IR profiles from the regen at two location beyond the downstream end mirror in order to obtain radius of curvature and waist information on the cavity. Waist and radius of curvature data are necessary to construct laser transport matrices for the pcgun drive laser. (Jeff Dooling)

• Needed to again have Test Stand RF reset by Controls Group. Was seeing no triggering of the

laser with Test Stand RF. (Jeff Dooling)

Other Research and Development

• Cathode R&D: Set up a meeting with IIT scientists to discuss a potential collaboration on superconducting photocathodes. (Kathy Harkay)

• Cathode R&D: Attended a presentation by Chun-xi Wang on the status of his LDRD (2/19), which I was asked to assume co-PI-ship of. Made a list of action items. (Kathy Harkay)

• Rewrote paper on ESASE-based mode-locked FELs (in collaboration with Sasha) to change emphasis onto its use as a source of multicolor x-rays. (Ryan Lindberg)

APS Machine Software

AOP Applications Software

• Released new versions of AOP software for Windows and OSX and worked on preparing Linux releases. (Robert Soliday)

Storage Ring

• Reviewed the mpsDumpReview scripts and made a few updates. (Aimin Xiao)

• tested and installed FPGAadcDelayScan for scan FPGA bpm adc delay and find the best adc delay for FPGA bpms, and improved the post-process and plot button. (Hairong Shang)

• Added FPAGadcDelayScan to OAGapps menu and OAGapps gnome drop-down menu. (Hairong Shang)

Injectors

• Fixed a problem with KickerAnalysis leaving temporary files behind. (Robert Soliday)

• Fixed the description for the ITS_SwitchToL3Down machine procedure. (Robert Soliday)

• added trigger offset implmentation to QF and QD to booster current ramp correction to work with booster injection tune controllaw, tested with CY. It worked, however the current ramp current still did not work well for BM, further improvement is considering. (Hairong Shang)

General

• Fixed a problem with sddscheck getting stuck in an endless loop when encountering an SDDS file that has binary junk in the header. This was seen with a file that got corrupted when a workstation was rebooted while it was being written to. (Robert Soliday)

• Wrote sdds2hdf which can be used to convert SDDS files into HDF5 files. (Robert Soliday)

Simulation Software

• fixed problems in SRCorrNoiseModel and SRFeedbackSimulation, made both matlab and C version simulation wrok. (Hairong Shang)

IOC/EPICS/Controls/Linux/Solaris/Linux Clusters/Data Loggers/Simulation software

• Added PVs to various data loggers per CY's request. (Robert Soliday)

• Updated the cronjob times on arrow to stagger them better. (Robert Soliday)

• Continued to look into the issue with nike locking up occasionally. (Robert Soliday)

Publications, papers and report

• Wrote section "traditional nonlinear beam dynamics" for a paper, to be published on JSR: Lattice Design Challenges for (Yipeng Sun)

• Fourth-Generation Storage Ring Light Sources. (Yipeng Sun)

• Wrote the injection section for the paper prepared for Journal of Synchrotron Radiation. Reviewed other part of the paper. (Aimin Xiao)

• write report "Gnome OAGapps Drop-Down Menu Correction and New Menu Addition, AOP-TN-2014-010" (Hairong Shang)

• Wrote a dynamic aperture scaling section for a JSR paper that is co-authored with Borland and others. Reviewed other parts of the paper. (Louis Emery)

Web Site

• Maintained AOP wiki website, Next-Generation Storage Ring Meetings. (Yipeng Sun)

Meetings, workshops, conferences, committees, LMS related, and reviews

• Gave an invited colloquium at the Purdue Physics Department on Accelerator Science. Collected introductory material from a variety of colleagues and sources. Met with several faculty to discuss areas of potential collaboration. (Kathy Harkay)

• Working on the draft of SAC review poster. (Aimin Xiao)

• Attended HiSOR user meeting and attending satellite meeting on light source upgrades. Gave talk on APS Upgrade using slides provided by upgrade team. (Louis Emery)

• Attended all-hands meeting. (Karen Schroeder)

Safety and Required Training

• took several training courses. (Hairong Shang)

• Took Ethics Training course (Karen Schroeder)

Miscellaneous

• Swapped out my old Sun desktop computer for a new Linux computer in my office. (Robert Soliday)

• Helped Weiming Guo (BNL) install SDDS on his Debian system (Robert Soliday)

• Helped Jonathan Edelen (Colorado State) with spiffe2elegant on his OSX machine. (Robert Soliday)

• Served as tour guide for the annual Argonne IGED event, conducting four 20-min tours of the APS. (Kathy Harkay)

• 1 day sick leave on Feb. 25 (Aimin Xiao)

• Visited with N. Mokhov to drop off a new cryptocard and took the chance to discuss the new version of MARS (15.14). (Jeff Dooling)

• took one and half days off as vacation (Hairong Shang)

• Completed OCF106. (Louis Emery)

• Referee a paper for Review of Scientific Instruments. (Louis Emery)

• Found some slides of old MOGA talks to give to Harkay. (Louis Emery)

• Scored 23 Director's post-doc applications. (Louis Emery)